



## **Report on Evaluation of Trainee Learning Achievement**

### **China FETPV Module 5 (weeks 2-3)**

Qingdao and Beijing, China

delivered by

The Royal Veterinary College with support from Cirad

under a Letter of Agreement

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London, UK, July 2012

## **Summary**

A three-week intensive revision module was delivered in May and June 2012 as the final part of the two-year China FETPV training programme involving a group of 14 trainees which had been selected by FAO. The second and third week were delivered by Cirad and FAO, the first by other trainers able to teach in Chinese. This was a revision module which covered a wide range of topics including biostatistics, disease frequency and causation, designing and evaluating animal health surveillance systems, outbreak investigations, risk assessment and risk communication, scientific writing, scientific presentations, and paper critiquing. The teaching was based on a combination of interactive lectures (with TurningPoint voting to enable audience participation), problem-based group learning sessions with case study examples, and one-to-one mentoring on individual assignments. The teaching in weeks 2 and 3 was delivered jointly by four experienced veterinary epidemiologists from the Royal Veterinary College (Prof. Dirk Pfeiffer, Prof. Javier Guitian, Dr Julian Drewe) and Cirad, the French Research Centre for Agricultural Development (Sophie Molia). Overall learning achievement of trainees was moderate to good. The majority of trainees felt they improved by a lot or a moderate amount in 10 key skills identified at the end of the course, and indicated they would be happy to teach their colleagues some of their newly-developed epidemiological skills. The trainees found certain areas difficult, in particular surveillance evaluation and quantitative risk assessment. A constraint to learning was the limited English language ability of several of the trainees.

## **Course Overview**

A 2-year Field Epidemiology Training Programme for Veterinarians (FETPV) for China was launched in November 2010. Fourteen trainees were selected by interview from several governmental veterinary services and research centres. The fifth intensive teaching module of the training programme was taught in Qingdao from 21 May to 3 June 2012 and in Beijing from 4 June to 8 June 2012. The learning objectives for this module are listed in the Appendix. Week 1 was taught in Chinese by experts from CAHEC, FAO and UPEI and covered biostatistics and mentoring of individual assignments (Outbreak investigation and Surveillance studies). Weeks 2 and 3 were taught in English by experts from RVC and Cirad and covered disease frequency and causation, designing and evaluating animal health surveillance systems, outbreak investigation, risk assessment and risk communication, scientific writing and scientific presentations, paper critiquing and mentoring of individual assignments (Outbreak investigation and Surveillance studies). The final two days of the last week (7 and 8 June) were taken up by meetings of FETPV stakeholders. As in the previous modules taught by Cirad/RVC, at least two (usually three) teachers were present during weeks 2 and 3 of the course to allow optimum learning support to the trainees.

## Assessment of Learning Achievement

The learning achievement of the trainees is presented in two formats in this report: (1) narrative reports of teachers' impressions; and (2) trainees' feedback and assessment of their own learning. This report covers weeks 2 and 3 of module 5 which were taught in English by FAO and Cirad.

### Narrative assessment of learning (week 2)

The 2nd week of module 5 started with a half-day session revising disease frequency and causal effect. This was delivered through lectures and group-based problem-solving work. Most of the trainees coped well with this subject although a weak area of understanding was confounding and interaction (these subjects were therefore revised again in a different format in week 3). The main topic of the afternoon was a revision of scientific writing techniques, plus a demonstration of web-based literature search facilities.

The first hour of the second day was spent on a warm-up session where trainees were tested upon how much they had understood and retained from the previous day. This was done using TurningPoint electronic remote voting facilities, which allowed the trainers to quickly identify areas where additional explanations were required. Accordingly considerable time was spent on some of the questions, but overall the performance of the trainees was satisfactory to good.

The main topic of the second day was a revision of surveillance, specifically surveillance system design and evaluation. Surveillance evaluation was a new approach to what should have been a familiar subject to the trainees, but despite this many found it difficult. Part of this difficulty stemmed from the need to understand a lot of definitions in English which some trainees struggled with initially (but were noticeably better the next day after having had more time to study the handouts). The day was organised in a series of three lectures each followed by a group-based practical session to apply and consolidate the information. Trainees worked in three groups allocated by the trainer (rather than their usual work groups). The trainees seemed attentive during the lectures, but active participation when asked questions by the trainers was limited. Further, a lot of support was needed to help the trainees work through the questions on the work sheets. This was disappointing given the importance of surveillance in animal health, and the fact that most of this was revision of previously-taught material and not a new topic.

The third day began with a revision of the previous day's topic (surveillance) using TurningPoint voting. Most questions were answered correctly by 60-70% of trainees. Questions where they struggled related to differentiating related attributes of surveillance systems such as coverage and representativeness, or specificity and false alarm rate. This suggests that most trainees were not thinking deeply but merely recalling definitions that had appeared the previous day.

The rest of day 3 was spent on mentoring of individual assignments on surveillance. This was done in small groups, with one trainer to 4-5 trainees. There was marked variation between trainees in quality of report and English language ability.

Day 4 consisted of class-based revision sessions on outbreak investigation, including case studies for trainees to work through individually or in pairs. They performed well in this task and appreciated the time taken to go through the calculations and answers afterwards. Further mentoring of individual assignments on surveillance projects was conducted in the afternoon.

Day 5 started with a revision session on the previous day's teaching which most trainees performed reasonably well on. An interactive seminar on risk assessment and risk communication followed in which the trainees answered the revision questions well. The session was designed to get progressively more difficult such that the last few questions were quite taxing. Whilst not all trainees got these correct, it was pleasing to find six trainees approach the trainer after the session to discuss one of the harder questions. This indicated that they had really thought about the topic and were able to critically think about risk assessment. Further mentoring of individual assignments on surveillance projects was conducted in the afternoon and on the morning of day 6.

Each group was allocated a scientific publication to critique which they started working on over the weekend.

### **Narrative assessment of learning (week 3)**

Topics for revision in the third week were selected by a confidential voting system whereby each trainee was asked to write down up to three areas they would like more tuition in. A summary of the trainees' requests is presented in Table 1. The requests with the most votes were then selected for tuition in week 3 (these topics shaded grey in Table 1).

**Table 1. Further revision topics requested by course attendees**

<b>Subject</b>	<b>Number of requests</b>
Study design, sample size, power analysis	3
Confounding and interaction	2
Attack proportion	2
Explanation of epidemic curve	1
How to design an effective poster	1
Modelling of multi-variable analysis	1
Modelling epidemiological data	1
Worksheet design	1
Statistical tests	1
Scientific writing	1

Day 1 of week three began with revision on study design, sample size and power analysis. This was done through a lecture and worked example that each trainee completed individually. Most did well on this task. The afternoon was spent as small group tuition sessions and paper critiquing.

Day 2 of week 3 began with an interactive seminar on preparing scientific posters which was well received. Trainees participated attentively. In the afternoon, groups presented their paper critique. The level of critical ability was reasonable though there was room for improvement particularly in challenging the assumptions and conclusions written in the papers. There was useful discussion between trainees within the presenting group and the tutors. Unfortunately participation of the rest of the groups was often poor and we had to make it clear again, that such feedback sessions are for everybody to critically think about the work others are doing, helping each other to progress by challenging them with questions on what they have done so far or to ask for more details in order to understand the subject if necessary.

Day 3 of week 3 covered outbreak investigation revision including individual-based exercises. The afternoon was dedicated to a truly interactive feedback session which provided much useful information on the trainees' learning experiences during the entire FETPV course. Details of this feedback session are given below.

## **Trainees' feedback and assessment of their own learning**

Half a day was dedicated to gathering feedback from trainees on the perception of their own and their colleagues' learning and use of skills gained during the FETPV course. The session was divided into three parts.

1. Key skills evaluation
2. Feedback session
3. Confidence in training others

Each of these is detailed below.

### **1. Key skills evaluation**

Trainees were paired randomly and each then introduced their partner to the rest of the group following a short time during which they questioned each other to find out what they really did for their job. A list of 10 key skills was identified that trainees should have learnt during the course. The 10 key skills were:

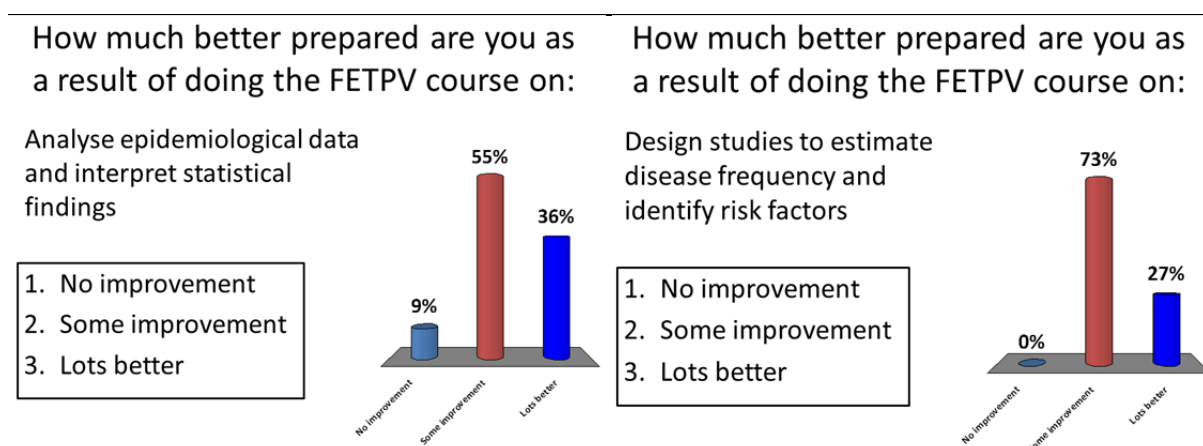
1. Analyse epidemiological data and interpret statistical findings
2. Design studies to estimate disease frequency and identify risk factors
3. Organise an outbreak investigation

4. Design a surveillance system
5. Evaluate a surveillance system
6. Lead a qualitative risk assessment
7. Carry out a quantitative risk assessment
8. Read and appraise scientific papers and reports
9. Professional exchange of epidemiological information in English
10. Communicate risk to public, farmers and policy makers

Each trainee was asked to select which of these skills they considered important for their job. Simultaneously, all the other trainees chose (using TurningPoint) up to three skills that they considered would be important for that trainee's work. There was remarkably good correlation between individuals' and classmates' interpretation of which skills were likely to be important in the workplace for each trainee. The most commonly chosen skills were "Analyse epidemiological data and interpret statistical findings", "Organise an outbreak investigation" and "Read and appraise scientific papers and reports". The least identified skill was "Carry out a quantitative risk assessment" which is not surprising since this had not been particularly emphasised during the course (qualitative risk assessment had been emphasised more). The skills selected suggest that trainees have benefited from the course in specific ways and can identify components of the course that will be useful for them when back in their workplaces.

## 2. Feedback session

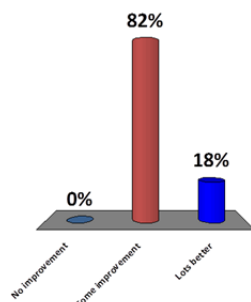
In this session, each of the 10 key skills was examined separately. Trainees were asked how much better prepared they felt able to do each skill as a result of completing the FETPV course. The results are shown in the following series of figures (percentages refer to the % of trainees selecting that option):



How much better prepared are you as a result of doing the FETPV course on:

Organise an outbreak investigation

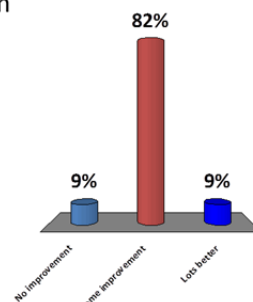
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Design a surveillance system

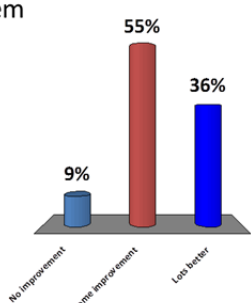
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Evaluate a surveillance system

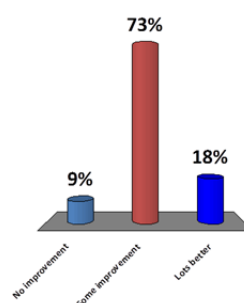
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Lead a qualitative risk assessment

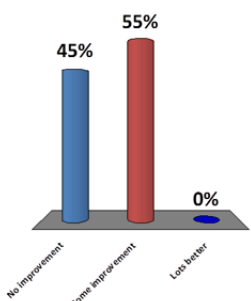
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Carry out a quantitative risk assessment

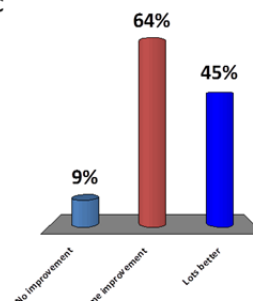
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Read and appraise scientific papers and reports

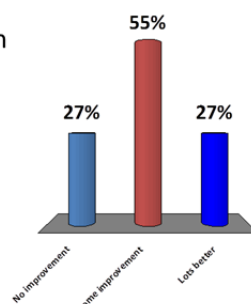
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Professional exchange of epidemiological information in English

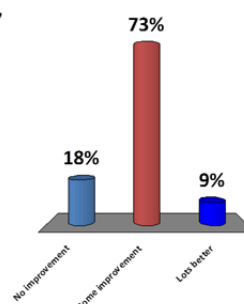
1. No improvement
2. Some improvement
3. Lots better



How much better prepared are you as a result of doing the FETPV course on:

Communicate risk to public, farmers and policy makers

1. No improvement
2. Some improvement
3. Lots better



These graphs show that the majority of trainees felt they are much more competent or have shown some improvement in all key skills. The skills that trainees felt most improved at undertaking as a result of completing the FETPV course were: reading and appraising scientific papers and reports (45% of trainees felt a lot better prepared to do this), analysing epidemiological data and interpreting statistical findings (36% of trainees felt a lot better prepared to do this) and evaluating a surveillance system (36% of trainees felt a lot better prepared to do this). The skills that trainees felt least improved in as a result of completing the FETPV course were carrying out a quantitative risk assessment (45% of trainees felt no better prepared to do this) and undertake professional exchange of epidemiological information in English (27% of trainees felt no better prepared to do this). A lack of improvement in exchanging information in English may be because trainees were already good at this skill, or perhaps more likely that they would benefit from the course more if they were better able to understand and speak English from the start.

### 3. Confidence in training others

Finally, trainees were asked to indicate which of the 10 skills they would be confident in training their colleagues in back at their workplace. Trainees could choose as many skills as they liked. The distribution of results is summarised below. It can be seen that trainees felt most comfortable teaching epidemiological analysis, study design for disease frequency analysis and risk factor identification, and designing a surveillance system (64% of trainees were confident to teach their colleagues who hadn't attended the FETPV course these subjects). The skills which trainees felt least comfortable with were evaluating a surveillance system (only 9% [1 trainee] felt confident teaching this) and carrying out a quantitative risk assessment (18% [2 trainees] felt confident teaching this).





## Conclusions

This fifth module of the FETPV course demonstrated that all trainees have attained a good standard of epidemiological knowledge during the FETPV course, which was further improved during the current module. This was a revision-based module consolidating previously taught material and the only new approach introduced was surveillance evaluation. Trainees as a result of this module indicated their enhanced ability to use epidemiology in an applied context and their confidence to teach certain topics to colleagues. The interaction between trainees and also between teachers and trainees was effective, as a result of increased confidence of the trainees as well as improved English language ability. However, it should be emphasized that English language ability still varies considerably in the group, and adversely affected the participation of some trainees in the discussions.

## Recommendations for the next FETPV-China course

The following recommendations are made by trainers from the RVC and Cirad based on observations made during teaching and feedback from the trainees of the first FETPV-China course.

1. Continued engagement of trainees from this first FETPV-China course so as to create a communication network to enable continued learning and support. This could take the form of a website or email discussion group, with links to course material and contact details of all the trainers. It may also be worth considering for current and past FETPV trainees to meet every 2 years for refresher or continuing development courses.
2. Ensure that all trainees selected for the next course have a good standard of English understanding and speaking before commencement of the course, in order to gain maximally from the teaching from day 1. Some trainees still struggled with English at the end of the first course, almost two years after enrolling.
3. Support from trainers, previous cohorts of FETPV trainees and from the hierarchy of trainees' employment should be ensured for periods outside the teaching modules. Applying the skills learnt during the different modules and completing the "in service" surveillance and outbreak assignments is indeed a central component of the FETPV programme.

## Appendix

### Learning objectives of Module 5

This was the final module of the course which sought to revise, reinforce and provide context to the most important concepts from previous modules. Feedback from trainees during the module was used to tailor the content of the remainder of the course.

Main objectives were to:

- Enhance the skills of trainees in the use of epidemiological tools and their implementation by consolidating their knowledge acquired during the previous training modules;
- Enhance the scientific writing and presentation skills;
- Improve knowledge of the basic statistical techniques used in veterinary epidemiology
- Mentor trainees towards achieving the outcomes of their TTS assignments (Field surveillance study/Outbreak investigation) and improve the quality of trainees' studies/OIs;
- Identify good quality studies/OIs for presentation at the stakeholder meeting, further national/international conference participation and scientific publication;
- Coach the trainee during publication writing about their TTS studies.